GUIDELINES FOR CAPSTONE PROJECT

BS Information Technology and BS Information Systems

I. INTRODUCTION

The School of Information and Computing Sciences is offering two Information Technology Education (ITE) Programs, the Bachelor of Science in Information Technology (BSIT) and the Bachelor of Science in Information Systems (BSIS). Both programs were designed based on CMO No. 53, series 2006 (Policies, Standards and Guidelines for ITE Programs) which stipulates that Capstone Project must be a requirement in both BSIT and BSIS programs.

In 2015, a more comprehensive guidelines in the implementation of Capstone Project was stipulated in CMO No. 25, series 2015 (Revised Policies, Standards and Guidelines for BS in Computer Science, BS in Information Technology and BS in Information Systems. Thus, these guidelines were anchored on the said CMO.

II. OVERVIEW OF PROGRAM SPECIFICATION (per CMO No. 25, s. 2015)

Bachelor of Science in Information Technology (BSIT)

The BS Information Technology program includes the study of the utilization of both hardware and software technologies involving planning, installing, customizing, operating, managing and administering, and maintaining information technology infrastructure that provides computing solutions to address the needs of an organization. The following outcomes are expected from a graduate for BSIT.

1. Apply knowledge of computing, science, and mathematics appropriate to the discipline.
2. Understand best practices and standards and their applications.
3. Analyze complex problems, and identify and define the computing requirements appropriate to its solution.
4. Identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.

5. Design, implement, and evaluate computer-based systems, processes, components, or programs to meet desired needs and requirements under various constraints.

6. Integrate IT-based solutions into the user environment effectively.

7. Apply knowledge through the use of current techniques, skills, tools and practices necessary for the IT profession.

8. Function effectively as a member or leader of a development team recognizing the different roles within a team to accomplish a common goal.

9. Assist in the creation of an effective IT project plan.

10. Communicate effectively with the computing community and with society at large about complex computing activities through logical writing, presentations, and clear instructions.

Bachelor of Science in Information Systems (BSIS)

The BS Information Systems Program includes the study of application and effect of information technology to organizations. Graduates of the program should be able to implement an information system, which considers complex technological and organizational factors affecting it. Graduates are able to help an organization determine how information and technology-enable business process can be used as strategic tool to achieve a competitive advantage. As IS professionals, they should have a sound understanding of organizational principles and practices so that they can serve as an effective bridge between the technical and management/users communities within an organization. They ensure that the organization has the information and the system it needs to support its operation. The following outcomes are expected from a graduate for BSIS.

1. Apply knowledge of business processes, computing, mathematics and social sciences appropriate for Information Systems.

2. Analyze a problem, identify and define the computing requirements with respect to organizational factors appropriate to its solution and plan strategies for their solution.

3. Evaluate information system in terms of general quality attributes and possible trade-offs presented within the given requirement.

4. Design, implement and evaluate information systems, processes, components, or programs and to source cost-benefit efficient alternatives to meet desired needs, goals and constraints.

5. Use knowledge and understanding of enterprises in modeling and design of information systems.

6. Deploy and use effectively skills, tools and techniques necessary for information systems practice.

7. Function effectively on teams (recognizing the different roles within a team and different ways of organizing teams) to accomplish a common goal.

8. Communicate effectively with a range of audiences. Communication skills include technical writing, presentation and negotiation, and numeracy.

9. Recognize the legal, social, ethical and professional issues involved in the exploitation of computer technology and be guided by the adoption of appropriate professional, ethical and legal practices both in the local and global community.

10. Recognize the need for and engage in an independent and life-long learning, planning self-learning and improving performance as the foundation for on-going professional development.

III. SPECIFICATION OF THE CAPSTONE PROJECT

Capstone Project is required for both BSIS and BSIT programs as stipulated in CMO 53, s. 2006 and CMO 25, s. 2015. It should function as terminal project requirement that would not only demonstrate a student's comprehensive knowledge of the area of study and research methods used but also allow them to apply the concepts and methods to a specific problem in their area of specialization. BS Information Technology students must complete a capstone project such as a software/system development with emphasis on the IT infrastructure, or an IT Management project. On the other hand, BS Information Systems students must complete a project such as business application development, or an Information Systems plan.

A **Capstone Project** is an undertaking appropriate to a professional field. It should significantly address an existing problem or need. An Information Technology Capstone Project focuses on the infrastructure, application, or process involved in implementing a Computing solution to a problem, while an Information Systems Capstone Project focuses on business process and the implications of introducing a Computing solution to a problem.

Capstone Project should integrate the different courses, knowledge, and competencies learned in the curriculum. Students are encouraged to produce innovative results, generate new knowledge or theories, or explore new frontiers of knowledge or application areas.

For Information Technology Capstone Projects, recommended infrastructure and its implications on other systems should be clearly specified in the final report of the project.

For Information Systems Projects, changes in process and information flow and/or information policies with the introduction of the system should be clearly specified in the final report.

CMO 25, s. 2015, Annex A recommends the following areas where Capstone Projects may be developed.

1. BS Information Technology
    a. Software Development
        i. Software Customization
        ii. Information Systems Development for an actual client (with pilot testing)
        iii. Web Applications Development (with at least alpha testing in live servers)
        iv. Mobile Computing Systems
    b. Multimedia Systems
        i. Game Development
        ii. Interactive Systems
        iii. Information Kiosks
    c. Network Design and Implementation and Server Farm Configuration and Management
    d. IT Management
        i. IT Strategic Plan for sufficiently complex enterprise
        ii. IT Security Analysis, Planning and Implementation
2. BS Information Systems
    a. Software Development
        i. Software Customization
        ii. Information Systems Development for an actual client (with pilot testing)
        iii. Web Applications Development (with at least alpha testing in live servers)

        iv.   Mobile Computing Systems

   b. IS Planning

        i.   Enterprise Resource Plan

        ii.   Information Systems Strategic Plan

   c. Analysis and Design of sufficiently complex business system

IV. POLICIES AND GUIDELINES

The Capstone Project in the School of Information and Computing Sciences is implemented as a two-semester Software Project (SP) course. SP 1 is offered in the 3rd Year, Second Semester, and continued in SP 2 during the 4th Year, First Semester.

a. Conduct of the Capstone Project

In SP1 students shall develop a project concept, prepare the proposal, conduct the necessary requirements analysis, feasibility analysis, and/or conduct assessment of information systems with the guidance of a Project Adviser. The same shall be documented and presented to a Review Committee. An outline for the documentation that shall be used is attached as Appendices A-1 and A-2.

In SP2, students shall implement the approved system design for software/system development projects. Documentation shall be prepared using the outline in Appendix B-1. There shall be two stages of presentation to the Review Committee. The completed system shall be presented before the testing stage. While the second and final presentation shall be done after the testing, where results of the testing shall be included in the documentation.

In case of proposals to design Information System Strategic Plan, students shall complete the ISSP using the outline in Appendix B-2. The concept of the recommended information systems shall be presented to the Review Committee before they proceed to resource planning. The final presentation shall be done after completing the ISSP. The outline in Appendix B-2 shall be used for the documentation of the ISSP.

b. Composition and Qualifications of the Review Committee

The review committee who will sit during the presentations shall be composed of the Project Adviser and three (3) reviewers, one of which shall act as Chairman. Other members of the Review Committee who will not be required to sit during the presentation shall include the Faculty-in-charge of SP class where the students are enrolled, and the Copy Editor. The Faculty-in-charge shall be the one to organize and facilitate the defense. Though not required, he/she may opt to attend the defense for monitoring purposes.

Members of the Review Committee should have a degree in a Computing or allied program or must be domain experts in the area. The Project Adviser must preferably have successfully completed a computing project beyond the bachelor's degree project. He/she should be a full-time IT faculty member in the School of Information and Computing Sciences. At least one of the panel members must have a master's degree in Computing.

c. **Honorarium for the Members of the Review Committee Members and Capstone Project Adviser**

During the conduct of the Proposal and Final Presentation the Review Committee members shall be given professional fees . The professional fees shall be provided by the by the students taking the Capstone Project 1 and 2.

Proposal Defense		Final Defense	
Adviser	800	Adviser	800
Chairman	400	Chairman	400
Member 1	400	Member 1	400
Member 2	400	Member 2	400

d. **Duties and Responsibilities**

Chairman

- Review proposal
- Give go signal to start and end the presentation
- Initiate question and answer
- Facilitate deliberation among the members of the committee
- Announce to the group the final decision of the committee

- Endorse to the Faculty-in-charge the committee's decision including the evaluation sheets.
- Assign substitute chairman in his/her absence

Member

- Review projects
- Participate in the panel discussion
- Ask question and give suggestions
- Write important comments and suggestion in the evaluation form
- Recommend substitute member in his/her absence subject to the approval of the chairman

Project Adviser

- Determine the appropriate complexity level of the specific problem being addressed and the proposed solution.
- Approves the composition of the project team considering the complexity of the project.
- Coach the team in conducting the project, from project development to implementation and defense.
- Do developmental editing on the manuscript and other project documents that the team may need to prepare.
- Check the system prior to presentation to review committee.
- Ensure that the team can make the presentation as scheduled.
- Recommend a project for presentation. He/she shall check the system as well as the documents to ensure that team is ready for the presentation.
- Guide and remind the group to write down panel members' comments and suggestions during presentation
- In cases where queries of the panel can't be answered by any of the team members, the Adviser may answer to ensure continuity of discussion. This may incur demerit to students rating.

- Monitor time during presentation

Faculty-In-Charge

- Orient the students on the requirements to pass SP courses.

- Discuss these guidelines to the students.

- Facilitate grouping of students.

- Schedule and organize the presentations/defense.

Copy Editor

- Check if the manuscript is complete.

- Check content and structure of the manuscript.

- Ensure correct referencing.

- Ensure that the manuscript conforms to the required style and format.

- Check grammatical construction.

CAPSTONE PROJECT 1

PROJECT PROPOSAL DEFENSE EVALUATION FORM

PROPOSED PROJECT:

_____

_____

I. Presentation of Problem Analysis (please encircle your rating)	30%
Every detail of the problem was analyzed and presented clearly	1
The problem was identified and analyzed with less details	2
The problem was identified and analyzed with very few details	3
The problem that needs to be solved was identified but not analyzed	4
Important problems that needs to be solved were not identified nor analyzed	5
II. Merit of the Project Concept (please encircle your rating)	**30%**
The project concept introduces innovations and new ideas to solve a problem	1
The project concept is a usual solution to a problem with outstanding significant/impact to stakeholders	2
The project concept is a usual solution to a problem with minimal significance/impact to stakeholders	3
The project concept will not fully address the problems	4
The project concept is not appropriate solution to the problem	5
III. Viability of the Project Plan (please encircle your rating)	**20%**
All aspects of the project (i.e., cost, time and scope) were planned	1
All aspects of the project plan were considered but were not completely presented	2
Few details in the plan is lacking	3
The plan needs to be improved	4
No project plan was presented	5
IV. Quality of System/Software Design (please encircle your rating)	**20%**
Requirements specification is complete and system design is ready for implementation	1
Very few details of the requirements specification and/or system design is lacking and will not hinder the implementation	2
Important details of the requirements specification and/or system design is lacking and will hinder the implementation	3
The requirements specifications and design are not enough	4
No requirements specification or system design was presented	5

INDIVIDUAL RATING FOR THE PROPONENTS

Proponents:

1. _____
2. _____
3. _____
4. _____

INDIVIDUAL ABILITY OF TEAM MEMBERS	TEAM MEMBER				
	1	2	3	4	
Ability to present and convey ideas and concepts					
Ability to answer questions					
Ability to defend every aspect of the proposal					
Confidence in presenting and answering questions					

Rating Scale:

Outstanding	-	1	Needs Improvement	-	4
Satisfactory	-	2	Poor	-	5
Fair	-	3			

_____

Signature over printed name of evaluator

SOFTWARE PROJECT
Final Defense Evaluation

Project Code: _____

Project Title: _____

EVALUATION CRITERIA		WEIGHT	RATING			
1. Cognitive Aspect						
1.1	The project is worth pursuing and presents new technologies and approaches.	10				
1.2	The project objective is timely and relevant to the course and target client.	5				
1.3	The reviewed literatures are timely and relevant to the project objectives.	5				
2. Software Product Aspect						
2.1	FUNCTIONALITY - The software features and functions defined in the Requirements Specification were implemented.	10				
2.2	SYSTEM DESIGN - Appropriate data structures, algorithms, database design, architecture, flatform and other software components were used.	10				
2.3	CORRECTNESS/ROBUSTNESS - The software is free from defects in its specification, design and implementation; and continue to function in the presence of invalid inputs or stressful environmental conditions.	10				
2.4	USABILITY/USER-FRIENDLINESS - The software is easy to use and can be learned without difficulty.	10				
3. Technical and Document Aspect						
3.1	Appropriate software development methodologies and procedures were applied. The software development lifecycle was followed.	5				
3.2	The manuscript is well-organized, free of grammitacal errors and used appropriate words and technical terms.	5				
3.3	The project result is worth prensenting in a conference or publishing in a technical paper.	5				
3.4	The project will revolutionize the present state of thinking about the present situation, knowledge, processes and system.	5				
4. Oral Defense Aspect (*Rate each proponent individually*)			**PROPONENTS**			
			1.	2.	3.	4.
4.1	The proponents exhibit mastery of the project and facilitate understanding of the different aspects of it.	5				
4.2	The presenters exhibit self-confidence during the oral presentation.	5				
4.3	The presenters satisfy the queries of the reviewers.	10				

RATING SCALE
1 - Exceptionally exceeded requirements
2 - Exceeds requirements
3 - Meets requirements
4 - Partially meets requirements
5 - Meets very limited requirements

Please write your comments/suggestions at the back so the group will be guided accordingly.

FINAL REMARKS: Rated by:
___ Passed   ___Passed with minor revisions   ___Re-defense

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Marinduque State College   Signature over printed name
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SOFTWARE PROJECT 1

ADVISER'S RATING

PROJECT CODE: _____

PROJECT TITLE: _____

_____

Name of Proponents	Commitment to the Project	Contribution in the Preparation of the Project Proposal			
		Ability to Analyze Problem	Ability to formulate solutions	Ability to design the proposed system	Ability to document the proposal

Rating Scale:

1 – Outstanding

2 – Very Satisfactory

3 – Satisfactory

4 – Less Satisfactory

5 – Not Satisfied

_____

Adviser (Signature Over Printed Name)

SOFTWARE PROJECT 2

ADVISER'S RATING

PROJECT CODE: _____

PROJECT TITLE: _____

_____

Name of Proponents	Commitment to the Project Implementation	Ability to Lead/Manage the Project	Contribution in the Implementation of the Project			
			Ability to implement the design (coding)	Ability to test the software	Flexibility adopt changes in the design	Ability to document the proposal

Rating Scale:

1 – Outstanding

2 – Very Satisfactory

3 – Satisfactory

4 – Less Satisfactory

5 – Not Satisfied

_____

Adviser's Signature Over Printed Name

Date:_____

APPENDIX A-1

OUTLINE OF SYSTEM DEVELOPMENT PROJECT PROPOSAL

I INTRODUCTION

- Background / Rationale

- Project Objectives

- Significance of the Project

- Scope of the Project

- Definition of Terms (Optional)

II REVIEW OF RELATED LITERATURE

III METHODOLOGY

- Requirements Analysis Procedures

- Feasibility Analysis Procedure

- Development and Testing Procedure
    - *Note: The testing procedure should clearly define a mechanism to collect errors encountered by the developers (Alpha test) and intended users (Beta test), for example: through email or provided forms*

- Installation Plan (Implementation at the client's site)

IV RESULTS AND DISCUSSION

- Description of the Existing System (if applicable)

- Requirements Specification

- Results of Feasibility Analysis

- Design of the Proposed System

- Description of the Prototype

REFERENCES

APPENDICES

- Dataflow Diagrams / Use Case Diagrams

    o *Note: must be present in in-text citation where applicable*

- Entity Relationship Diagram

    o *Note: must be present in in-text citation where applicable*

- Database Schema

    o *Note: must be present in in-text citation where applicable*

- Test Cases

    o *Note: must be present in in-text citation where applicable*

PROPONENTS PROFILE

APPENDIX A-2

OUTLINE OF INFORMATION SYSTEMS ASSESSMENT FOR ISSP

PART I. ORGANIZATIONAL PROFILE

A. Agency Mission and Vision Statement

- Mandate

- Vision Statement

- Mission Statement

- Major Final Outputs (if applicable)

B. Agency Profile

- Name of Designated IS Planner (or equivalent)

- Current Annual ICT Budget

- Organizational Structure (appendix: organizational structure & organizational matrix)

  o   Total Number of Employees

  o   Number of Extension Offices (if any)

  o   Number of Provincial Offices (if any)

  o   Number of Field or District Offices (if any)

C. Agency Functional Interface Chart

D. Present ICT Situation (Strategic Challenges)

E. Strategic Concerns for IT Use (use prescribed matrix)

APPENDIX A-2

OUTLINE OF INFORMATION SYSTEMS STRATEGIC PLAN

PART I. ORGANIZATIONAL PROFILE

F. Agency Mission and Vision Statement

- Mandate

- Vision Statement

- Mission Statement

- Major Final Outputs (if applicable)

G. Agency Profile

- Name of Designated IS Planner (or equivalent)

- Current Annual ICT Budget

- Organizational Structure (appendix: organizational structure & organizational matrix)

   o Total Number of Employees

   o Number of Extension Offices (if any)

   o Number of Provincial Offices (if any)

   o Number of Field or District Offices (if any)

H. Agency Functional Interface Chart

I. Present ICT Situation (Strategic Challenges)

J. Strategic Concerns for IT Use (use prescribed matrix)

PART II. INFORMATION SYSTEMS STRATEGY

A. Diagram of Information Systems Interface

B. Detailed Description of Proposed Information Systems (use prescribed matrix)

C. Databases Required (use prescribed matrix)

D. Network Layout

PART III. DETAILED DESCRIPTION OF ICT PROJECTS

A. Internal ICT Projects (use prescribed matrix)

B. Cross-Agency ICT Projects (use prescribed matrix)

C. Performance Measurement Framework (use prescribed matrix)

PART IV. RESOURCE REQUIREMENTS

A. Deployment of ICT Equipment and Services (use prescribed matrix)

B. ICT Organizational Structure

- Existing ICT Organizational Structure

- Proposed ICT Organizational Structure

- Placement of the Proposed ICT Organizational Structure in the Agency Organizational Chart

PART V. DEVELOPMENT AND INVESTMENT PROGRAM

A. ICT Projects Implementation Schedule (use prescribed matrix)

B. Information Systems Implementation Schedule (use prescribed matrix)

C. Summary of Investments (use prescribed matrix)

D. Annual Cost Breakdown (use prescribed matrix)

APPENDIX B-1

OUTLINE OF COMPLETED SYSTEM DEVELOPMENT
PROJECT

I INTRODUCTION

- Background / Rationale

- Project Objectives

- Significance of the Project

- Scope of the Project

- Definition of Terms

II REVIEW OF RELATED LITERATURE`

III METHODOLOGY

- Requirements Analysis

- Feasibility Analysis Procedure

- Development and Testing Procedure
    - *Note: The testing procedure should clearly define a mechanism to collect errors encountered by the developers (Alpha test) and intended users (Beta test), for example: through email or provided forms*

- Installation Plan (Implementation at the client's site)

IV RESULTS AND DISCUSSION

- Description of the Existing System (if applicable)

- Requirements Specification

- Results of Feasibility Analysis

- Design of the Proposed System

- Description of the Prototype

- Implementation Result

- Testing Result
    - *Results of Alpha & Beta Test using the error collection facility as stated*

V RECOMMENDATIONS

REFERENCES

APPENDICES

- Dataflow Diagram
  - *Note: must be present in in-text citation where applicable*

- Entity Relationship Diagram
  - *Note: must be present in in-text citation where applicable*

- Database Schema
  - *Note: must be present in in-text citation where applicable*

- Test Cases
  - *Note: must be present in in-text citation where applicable*

- User's Manual

OUTLINE OF COMPLETED NETWORK DESIGN AND IMPLEMENTATION PROJECT

VI   INTRODUCTION

- Background / Rationale

- Project Objectives

- Significance of the Project

- Scope of the Project

- Definition of Terms

VII   REVIEW OF RELATED LITERATURE`

VIII   METHODOLOGY

- Requirements Analysis

- Feasibility Analysis Procedure

- Network Design Procedure

- Installation Plan (Implementation at the client's site)

IX RESULTS AND DISCUSSION

- Description of the Existing Network Design (if applicable)

- Requirements Specification

- Results of Feasibility Analysis

- Description of the Implemented Network Design

- Implementation Result

X RECOMMENDATIONS

REFERENCES

APPENDICES

- Data Gathering form
    - *Note: must be present in in-text citation where applicable*

- Work Breakdown Structure
    - *Note: must be present in in-text citation where applicable*

- Gantt Chart
    - *Note: must be present in in-text citation where applicable*

- Gap Analysis/ SWOT Analysis
    - *Note: must be present in in-text citation where applicable*

- Etc.